

## TULSI-A PROMISING HERB IN DENTISTRY

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### ABSTRACT:

*The plants are used for medicinal purpose since ancient times. In ancient India the traditional medicine practitioners observed tulsi as greatest healing herb with high therapeutic potential. The tulsi plant is an erect softy hairy aromatic herb or under shrub of labiatae family belonging to genus 'Ocimum' and is found throughout India. Tulsi has been proven for management of many medical disorders due to its properties like expectorant, analgesic, anticancer, antiasthmatic, antiemetic, diaphoretic, antidiabetic, antifertility, hepatoprotective, hypotensive, hyolipidimic and antistress agent by many research studies. Tulsi can be promising herb in treatment of many oral disorders due to its anti-inflammatory, antibacterial, antioxidant and immuno-modulatory properties however more research and studies are needed to establish this miraculous herb as treatment modality in dentistry. This paper focuses on dimension and scope of Tulsi in management of oral disease.*

**Keywords:** Tulsi, *Ocimum sanctum*, Herbal extract, Medicinal Plants

### INTRODUCTION

The plants are used for medicinal purpose since ancient times. The history of therapeutic use of plants is as old as 4000–5000 B.C. The Chinese were the first to use natural herbal preparations as medicines<sup>1</sup>. The tulsi in sanskrit means 'incomparable or matchless'. In ancient India the traditional medicine practitioners observed tulsi as greatest healing herb with high therapeutic potential<sup>2</sup>. The botanical name of tulsi is 'Ocimum sanctum Linn'. In hindi it is known as 'Tulsi' and 'Holy Basil' in English<sup>3</sup>. The tulsi plant is an erect softy hairy aromatic herb or under shrub of labiatae family belonging to genus 'Ocimum' and is found throughout India having high therapeutic potential<sup>1-3</sup>. Tulsi is known in different regions, languages and dialects of India by a variety of other names such as Tulasi, Surasah, Ajaka, Parnasa, Manjari, Haripriya and Bhutagni. Several species of tulsi has been seen worldwide. In India most commonly cultivated species is *Ocimum sanctum* Linn. There is two types of *Ocimum sanctum* Linn. The first type is green leaves type known as sri tulsi and second is purple leaves type known as krishna Tulsi<sup>3</sup>. Other species of genus *Ocimum* which have high therapeutic potential and cultivated worldwide are *Ocimum gratissimum* (Ram Tulsi), *Ocimum canum* (Dulal Tulsi), *Ocimum basilicum* (Ban Tulsi), *Ocimum kilimandscharicum*, *Ocimum ammericanum*, *Ocimum camphora* and *Ocimum micranthum*<sup>4,5,6,7</sup>. In Ayurveda tulsi has been well documented for its therapeutic potentials and described as Dashemani Shwasaharni (antiasthmatic) and antikaphic drugs<sup>1</sup>. The leaves, stem, flower, root, seeds and even whole plant of *ocimum sanctum* Linn is used in traditional medicine. Tulsi is often enjoyed as a simple herbal tea and is frequently blended with other herbs and spices for various medicinal and culinary purposes<sup>7</sup>. The Indian scientists and researchers have carried out several studies to find

out the therapeutic potential of *Ocimum sanctum* Linn<sup>5,8</sup>.

### CHEMICAL CONSTITUENTS OF TULSI

1. Eugenol & Essential Oils - *Ocimum sanctum* L. (Tulsi) and *Ocimum basilicum* (Ban Tulsi) are cheaper sources for commercial extraction of eugenol. The aerial parts (leaves, flowers & stem) of tulsi contain essential oils with good percentage of eugenol. The leaves of *ocimum sanctum* L. are chief source of essential oils followed by the inflorescence and stem however flowers contain more essential oils than leaves in *ocimum basilicum*. The roots and fruits of these plants are almost completely devoid of any essential oil. The essential oil extracted from the tulsi leaves by steam distillation largely contains eugenol. The other important constituents of the essential oil are carvacrol, methyl eugenol, caryophyllene.

To produce eugenol-rich *ocimum* variety scientists of Regional Research Laboratory (RRL), Jammu have developed a hybrid strain of *ocimum gratissimum* L. using recurrent selection (FCA) technique of breeding and named it as "Clocimum". This "Clocimum" variety contains 60–65% eugenol. Another heterotic F1 strain of *ocimum* has been developed by Regional Research Laboratory (RRL) and named as "Clocimum-3c". This is an improved eugenol-rich *ocimum* variety containing 90–95% eugenol<sup>8,9</sup>.

2. Carracrol and tetpene & Sesquiterpene b caryophylline<sup>10</sup>
3. Linalool<sup>10</sup>
4. Polyphenol rosmarinic acid<sup>10</sup>
5. Vitamin A, C, Zinc & Iron<sup>10</sup>

### THERAPEUTIC USES OF TULSI IN DENTISTRY

Tulsi is generally considered as an "Elixir of Life". Traditionally tulsi has been employed in hundreds of different formulations for the treatment

of a wide range of disorders involving mouth and throat, lungs, heart, blood, liver, kidney, and the digestive, metabolic, reproductive and nervous systems. The different part of tulsi like leaves, roots, flowers and stems have charismatic therapeutic potential. Tulsi has been used as expectorant, analgesic, anticancer, antiasthmatic, antiemetic, diaphoretic, antidiabetic, antifertility, hepatoprotective, hypotensive, hypolipidemic and antistress agent<sup>5</sup>. As tulsi is a very effective in treatment of various medical disorders, It is also a very promising herb in management of oral diseases and dentistry. Tulsi leaves are quite effective in treating common oral infections. The tulsi leaves contains strong antibacterials like caracrol and tetpene & sesquiterpene b caryophylline. Chewing of tulsi leaves help in maintenance of oral hygiene. The antibacterials present in tulsi leaves are approved by FDA as food additive<sup>10</sup>.

Ocimum sanctum leaves contain 0.7% volatile oil comprising about 71% eugenol and 20% methyl eugenol. Due to significant amount of eugenol (1-hydroxyl-2 methoxy-4 allyl benzene) tulsi is a strong COX-2 inhibitor. This antianalgesic property of tulsi is utilized in treatment of dental and mucosal pain<sup>11</sup>. The powdered tulsi leaves mixed with mustard oil can be used as toothpaste for tooth brushing. The powdered tulsi leaves used to encounter halitosis and maintaining good oral health. Massage with tulsi powder have reported to be highly effective in many gingival and periodontal diseases<sup>10,11</sup>. The tulsi extract has high antimicrobial activity against streptococcus mutans. The streptococcus mutans has been reported to be key microorganism causing dental caries. In an in vitro study it was found that 4% concentration of tulsi extract has highest antimicrobial activity<sup>10</sup>. The Tulsi also possesses a great antifungal activity. In a study conducted by Khan A et al<sup>12</sup> it was concluded that linalool and eugenol which are present in essential oil extracted from tulsi are effective against two strains of candida (*C. albicans* and *Candida tropicalis*) but linalool is more effective than eugenol against candidiasis. The tulsi have property of immunomodulation. It also acts on skin and hemopoietic tissues. So the tulsi can be used in treatment of oral lichen planus. However further studies are needed to evaluate efficacy of tulsi in treatment of oral lichen planus<sup>13</sup>. Tulsi can also be used as antioxidant therapy in both leukoplakia and oral submucous fibrosis. The polyphenol rosmarnic acid is a strong antioxidant present in tulsi. So it can be used in treatment of all other oral precancerous lesions and conditions<sup>6,10</sup>.

Due to immunomodulating property, the ocimum sanctum can be used in treatment of pemphigus. The tulsi causes healing of sores and blisters. More studies are needed to evaluate the potential use of immunomodulatory effect of tulsi in

immunologically mediated mucosal disorders like pemphigus<sup>13</sup>. The ocimum sanctum is a potent anti-ulcerogenic and have ulcer healing properties. Ocimum sanctum in dose of 100mg/kg was found to be effective against ulcers. The antiulcer effect of ocimum sanctum is reported to be due to cytoprotective effect rather than anti-secretory activity. Tulsi is effective in both oral ulcers and peptic ulcer<sup>14</sup>. The tulsi is a rich source of vitamin A, Vitamin C, zinc and iron. It is also a rich source of chlorophyll and other polynutrients. So it can be used as dietary supplements in oral diseases arising due to deficiency of these nutrients<sup>15</sup>.

## CONCLUSION

As tulsi has been regarded as an 'elixir for life' due to its great therapeutic potential. Tulsi has been proven for management of many medical disorders due to its properties like expectorant, analgesic, anticancer, antiasthmatic, antiemetic, diaphoretic, antidiabetic, antifertility, hepatoprotective, hypotensive, hypolipidemic and antistress agent by many research studies. However in Ayurveda it has been used since ancient times.

As oral diseases are concerned, tulsi can be promising herb in treatment of many oral disorders due to its anti-inflammatory, antibacterial, antioxidant and immunomodulatory properties however more research and studies are needed to establish this miraculous herb as treatment modality.

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